

CLAIMS

What is claimed is:

- 1 1. A high specimen yield anti-reflux head for a needle aspiration
2 biopsy device, comprising:
3 a hub defining a specimen collection well and mounting a needle having a
4 shaft with an open pointed tip; and
5 a sample passageway extending from the pointed tip of the needle to a
6 segment inside the hub opening in spaced relation to a floor of the collection
7 well.
- 1 2. The device of claim 1, wherein the needle defines the entire
2 passageway extending from the pointed tip to a contoured proximal end.
- 1 3. The device of claim 2, wherein the hub defines an opening in the
2 floor of the collection well through which the needle shaft extends.
- 1 4. The device of claim 2, wherein the proximal end of the needle
2 includes a segment that extends along and opens about a lateral axis at an angle
3 to a longitudinal axis of the needle.
- 1 5. The device of claim 4, wherein the lateral and longitudinal axes are
2 essentially perpendicular.
- 1 6. The device of claim 3, wherein the proximal end of the needle in
2 part follows the contour of the collection well.
- 1 7. The device of claim 1, wherein the passageway is defined in part
2 by the needle and in part by an internal channel in the hub.
- 1 8. The device of claim 7, wherein the needle has a straight proximal
2 end disposed at an opening in the hub defining an end of the channel.

1 9. The device of claim 8, wherein the proximal end of the needle has
2 raised barbs.

1 10. The device of claim 8, wherein the channel includes a lateral
2 segment that extends along and opens about a lateral axis at an angle to a
3 longitudinal axis of the needle.

1 11. The device of claim 10, wherein the lateral and longitudinal axes
2 are essentially perpendicular.

1 12. The device of claim 1, wherein the collection well has an anti-
2 coagulant surface.

1 13. The device of claim 12, wherein the anti-coagulant surface is a
2 coating of ACD or EDTA.

1 14. The device of claim 1, wherein the needle has an anti-friction
2 surface.

1 15. The device of claim 14, wherein the anti-friction surface is a Teflon
2 coating.

1 16. The device of claim 1, wherein the hub includes an outer grip.

1 17. The device of claim 15, wherein the hub has an open mouth
2 allowing access to the collection well.

1 18. The device of claim 17, further including a lid securable to the hub
2 to cover the mouth.

1 19. The device of claim 1, wherein the collection well has a volume of
2 at least 100 μ L.

1 20. The device of claim 1, further including a sheath stand defining an
2 elongated cavity for containing the needle and having an open end mountable to
3 the hub.

1 21. The device of claim 1, wherein the needle defines a scoop opening
2 at a side of the needle in communication with the passageway.

1 22. A high specimen yielding anti-reflux needle aspiration biopsy
2 device, comprising:
3 a syringe including a barrel and a piston slidable within the barrel;
4 a valve for controlling an opening in the syringe barrel;
5 a hub linked to the valve and defining a specimen collection well; and
6 a needle mounted to the hub having a shaft with an open pointed tip;
7 wherein one or more of the hub and needle define a passageway
8 extending from the needle tip to inside the hub opening in spaced relation to a
9 floor of the collection well.

1 23. The device of claim 22, further including a coupler containing the
2 valve and connecting the hub to the syringe.

1 24. The device of claim 22, wherein the needle defines the entire
2 passageway extending from the pointed tip to a contoured proximal end.

1 25. The device of claim 22, wherein the passageway is defined in part
2 by the needle and in part by an internal channel in the hub.

1 26. The device of claim 25, wherein the needle has a straight proximal
2 end disposed at an opening in the hub defining an end of the channel.

1 27. The device of claim 22, wherein the collection well has an anti-
2 coagulant surface and the needle has an anti-friction exterior surface.

1 28. The device of claim 22, further including a sheath stand defining an
2 elongated cavity for containing the needle and having an open end mountable to
3 the hub.

1 29. The device of claim 22, further including a piston lock mounted to
2 the syringe so as to fix the position of the piston relative to the barrel.

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1 30 ~~20~~. The device of claim 22, wherein the needle defines a scoop
2 opening at a side of the needle in communication with the passageway.

1 31. A method of needle aspiration biopsy using a device as recited in
2 claim 22, comprising the steps of:
3 creating a vacuum in the syringe;
4 inserting the needle into a specimen sample site;
5 communicating the vacuum to the needle;
6 probing the specimen sample site with the needle to collect specimens in
7 the collection well of the hub;
8 releasing the vacuum in the needle;
9 withdrawing the needle from the specimen sample site;
10 separating the hub from the device; and
11 transferring specimens collected in the hub to an examination site.

1 32. The method of claim 31, wherein the step of creating a vacuum in
2 the syringe includes closing the valve and pulling the syringe piston away from
3 the syringe barrel.

1 33. The method of claim 32, wherein the vacuum is communicated to
2 the needle by opening the valve.

1 34. The method of claim 33, wherein the step of releasing the vacuum
2 in the needle includes reclosing the valve.

1 35. A high specimen yielding anti-reflux needle aspiration biopsy
2 device, comprising:
3 a syringe including a barrel and a piston slidable within the barrel;
4 a valve for controlling an opening in the syringe barrel;
5 a hub linked to the valve and defining a specimen collection well having a
6 volume of more than 500 micro liters; and
7 a needle mounted to the hub having a shaft with an open pointed tip;
8 wherein one or more of the hub and needle define a passageway
9 extending from the needle tip to inside the collection well.

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1 ~~36~~ ~~37~~. A high specimen yielding anti-reflux needle aspiration biopsy
2 device, comprising:
3 a syringe including a barrel and a piston slidable within the barrel;
4 a valve for controlling an opening in the syringe barrel; and
5 a hub linked to the valve and defining a specimen collection well, wherein
6 the hub defines an internal passageway for putting the collection well in
7 communication with a lumen of a needle.

1 ~~37~~ ~~38~~. The device of claim 37, wherein the collection well has an interior
2 volume of at least 100 micro liters.

1 ~~38~~ ~~39~~. The device of claim 37, wherein the internal passageway opens to
2 an interior of the collection well through an opening spaced from a floor of the
3 collection well.